

REMARKS

Claims 1-22 are pending in this application. Claim 22 is amended in several particulars for purposes of clarity in accordance with current Office policy, to assist the examiner and to expedite compact prosecution of this application. The Applicant appreciates the Examiner's indication of allowability concerning claims 2, 5, 6, and 14.

The Applicant appreciates the Examiner's comments in the Advisory Action of Paper No. 20060707 and therefore, each of the Examiner's concerns have been addressed below, in addition to the response to the final Office action of Paper No. 200603.

I. Claim Rejections - 35 USC § 112

A. The Examiner stated that Claim 22 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement as the claimed "step of said activation layer," is not disclosed in the application as filed.

Claim 22 has been amended to delete the "step of said activation layer".

B. The Examiner stated that Claim 22 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 22, line 3, "the step of said activation layer," has no antecedent basis according to the Examiner.

Claim 22 as mentioned above deletes the step of said activation layer.

The Examiner states that in claim 22, line 1, "the step of said buffer layer," has no antecedent basis.

However, respectfully there is antecedent basis because in claim 1 (claim 22 depends on claim 1), it states, "with said buffer layer having a step". Therefore, there is antecedent basis to the step of said buffer layer, and therefore no amendment is necessary.

Entry of the foregoing amendments to claim 22 is proper under 37 C.F.R. 1.116(b) because those amendments simply respond to the issues raised in the final rejection, no new issues are raised, no further search is required, and the foregoing amendments are believed to remove the basis of the outstanding rejections and to place all claims in condition for allowance. The foregoing amendments, and explanations, could not have been made earlier because they are merely responsive to issues newly raised in Paper No. 200603 and 20060707.

II. Claim Rejections - 35 USC § 102

No claim is anticipated under 35 U.S.C. §102 (b) unless all of the elements are found in exactly the same situation and united in the same way in a single prior art reference. As mentioned

in the MPEP §2131, “a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Every element must be literally present, arranged as in the claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913, 1920 (CAFC 1989). The identical invention must be shown in as complete detail as is contained in the patent claim. *Id.*, “All words in a claim must be considered in judging the patentability of that claim against the prior art.” *In re Wilson*, 424 F.2d 1382, 165 USPQ 494, 496 (CCPA 1970), and MPEP 2143.03.

A. Claims 1 and 13 stand rejected under 35 U.S.C. 102(b) as being anticipated by BUSTA (4,949,141). The Applicant respectfully traverses.

1. With regard to claims 1 and 13, the Examiner states that Busta discloses a thin film transistor comprising a buffer layer 12-32 formed on a substrate 10. On page 12 of the Examiner’s response, the Examiner clarifies that Busta’s layers 12 and 32 together form the claimed buffer.

Respectfully, the claim states “a buffer layer... said buffer layer having a step”. On the other hand in Busta, pixel element 12 and the drain layer 32 are separate from each other. Layers 12 and 32 are different from each other as one is a pixel element and the other is a drain layer, respectively. Therefore, 12 and 32 are two different layers. Therefore, both layers 12 and 32 should not be combined to anticipate the buffer layer of the present invention. As mentioned above in MPEP §2131, the identical invention must be disclosed, and respectfully here, Busta does not identically

disclose a buffer layer as arranged in the claim.

Moreover, it is entirely clear that the drain layer 32 and the pixel element 12 can be construed as a buffer layer since the identical invention must be disclosed.

In the advisory action of paper no. 20060707, the Examiner states that that there is a critical question: Consistent with the specification, what is the broadest reasonable meaning of the term, “a buffer layer?” The Examiner states that applicants clearly state their view is that the two part layer of Busta is not the claimed layer, but Applicants put forward no argument, or evidence, of what the language claiming said layer should actually be construed as.

First of all, the claim states the step in “a buffer layer” and the step of two different layers. Further, reference 12 is a pixel element rather than what would be construed a buffer layer.

2. Concerning claims 1 and 13, since it not clear that 12 and 32 of Busta forms the buffer layer, then it is not clear that the step is then half or less of the thickness sum of the activation layer.

In addition, if 12 and 32 are argued to be part of the buffer layer, then one can additionally argue that SiH 34 can also be part of the buffer layer. Then if that is so, then it is clear that the step is not half or less of the thickness sum of the activation layer as seen in claim 1 or up to half as in claim 13.

B. Amended claims 4 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by BUSTA (4,949,141). The Applicant respectfully traverses.

1. Concerning claims 4 and 16, Busta fails to disclose *said activation layer comprising an excimer laser annealing polysilicon, and thickness of the gate insulation layer is at least 1,000 Å when a thickness of said excimer laser annealing polysilicon is 500 Å and step is 750 Å in said activation layer.*

The Examiner states that Busta discloses an activation layer comprising a polysilicon of 500 angstroms. However, looking at column 5, line 9, Busta states that element 36 is 500-1500 Angstroms. However, 36 is defined as a-n+Si:H (col. 5, lines 6-10), which is a hydrogenated amorphous silicon. A hydrogenated amorphous silicon is a non-crystalline form of Silicon, which is then not necessarily a polysilicon. Amorphous silicon is different than a polysilicon and so the thickness is not disclosed. The identical invention is not disclosed by Busta.

In the advisory action of paper no. 20060707, the Examiner states however, Applicants cite a portion (col. 5 lines 6-10) of Busta that, in Busta's exact words, states that "The layers 32 and 36 could also be formed of microcrystalline [emphasis added] n.sup.+Si instead of a-n.sup.+ Si:H." Microcrystalline silicon is a crystalline form of silicon, which is then necessarily a polysilicon. The Examiner also states that this portion for the proposition that layer 36 may be either amorphous or microcrystalline.

Respectfully, Busta mentions microcrystalline which is not necessarily polysilicon.

Nanocrystalline silicon which is also referred to as microcrystalline silicon is an allotropic form of silicon, which is similar to amorphous silicon, in that it has an amorphous phase, but they differ, in terms of microcrystalline silicon has small grains of crystalline silicon within the amorphous phase. This is in contrast to polycrystalline silicon (poly-Si) which consists solely of crystalline silicon grains, separated by grain boundaries. Although the microcrystalline silicon cannot attain the mobility that poly-Si has, it has the difference over poly-Si that it can be deposited using conventional low temperature a-Si deposition techniques, such as PECVD as opposed to laser annealing. The claim also states specifically "laser annealing polysilicon". When a person of ordinary skill in the art is referring to polysilicon, they are not referring to microcrystalline silicon even though the Examiner may argue that one maybe inclusive of the other, but a person of ordinary skill in the art still separates the two.

C. Claims 1 and 13 stand rejected under 35 U.S.C. 102(b) as being anticipated by ADACHI ET AL. (5,985,704). The Applicant respectfully traverses.

1. With regard to claims 1 and 13, the Examiner states the following: that Adachi et al. discloses a thin film transistor with a buffer layer 22 (12 in figure 1) formed on a substrate 21 (11); a 1000-1500 angstrom activation layer 13 (23 in figure 2) formed on said buffer layer 22 (12 in figure 1); and a 300 angstrom gate insulation layer 29 formed on said substrate 21 (11) including said activation layer 13 (23 in figure 2), with said buffer layer 22 (12 in figure 1) having a step "y" formed between a lower part of said activation layer 13 (23 in figure 2) and a part except said lower part of said activation layer 13 (23 in figure 2), the step "y" in the buffer layer 22 (12 in figure 1)

being 80-500 angstroms thick and thus a half or less of the thickness sum (1000-1500 plus 300 angstroms) of said activation layer 23 (1000-1500 angstroms thick) and gate insulation layer 29 (300 angstroms thick). Note figures 1A-1E, 2A-E, column 4 lines 1-5 and 20-24, and column 8 lines 1-5, 18-24, and 41-55 of Adachi et al.

However, the measurements given for the layers above, are for the intermediate product and not the final product. For example, in example one of Adachi, it states, "Then, an amorphous silicon film 13 is deposited on the silicon oxide film 12 by a plasma CVD to a thickness of 500.ANG. to 1500.ANG., for example, 1000.ANG." Therefore, it is the intermediate measurements given and not the final. The claim relates to a final product and not the intermediate product as the measurements disclose in Adachi and so the identical invention is not disclosed.

In the advisory action of paper no. 20060707, the Examiner states that Adachi's example 1, cited here by Applicants, also states (column 4 line 36) that step "y" is 80-90 angstroms, and in column 8 line 52 Adachi et al. state that gate insulation layer (in its final product) 65 may be up to 300 angstroms thick. Adachi et al. achieve a step so small (80-90 angstroms) that it is less than half the thickness of the gate insulation layer alone, and thus obviously less than half the sum of the thicknesses of the gate insulation layer and the activation layer, regardless of the method used to make the activation layer.

However, step y of 80-90 angstroms is from example one and the 300 angstroms is from

example 4. Further, drawings unless, they are drawn to scale cannot be used exclusively to reject a claim. Specifically in the MPEP §2125 under the heading “DRAWINGS AS PRIOR ART” and under the subheading “PROPORTIONS OF FEATURES IN A DRAWING ARE NOT EVIDENCE OF ACTUAL PROPORTIONS WHEN DRAWINGS ARE NOT TO SCALE”, the MPEP states “When the reference does not disclose that the drawings are to scale and is silent as to dimensions, arguments based on measurement of the drawing features are of little value. However, the description of the article pictured can be relied on, in combination with the drawings, for what they would reasonably teach one of ordinary skill in the art. *In re Wright*, 569 F.2d 1124, 193 USPQ 332 (CCPA 1977).

III. Claim Rejections - 35 USC § 103

According to MPEP 706.02(j), the following establishes a *prima facie* case of obviousness under 35 U.S.C. §103:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references

when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

A. Amended claims 3 and 15, and new claim 21, are rejected under 35 U.S.C. 103(a) as being unpatentable over ADACHI ET AL. (5,985,704) in view of YAMAZAKI ET AL. (2004/0211356). The Applicant respectfully traverses.

1. Both Adachi and Yamazaki fail to teach or suggest an activation layer comprising a solid-phase crystallization polysilicon. Adachi teaches an amorphous silicon layer as seen in col. 7 of Adachi (as seen in reference 13 and 23) and Yamazaki teaches an amorphous silicon film as seen in paragraph 89. An amorphous silicon film is a silicon that does not have a crystalline structure and contrast that with the crystallization polysilicon, which is a silicon with a crystalline structure. Therefore, the measurements given for the amorphous silicon layer are not related to the presently claimed invention.

2. Respectfully, the Examiner's statement that the solid phase crystallization is not the final product is not a correct statement as seen in paragraph 38 of the present invention. Therefore, as

seen in the original claim of the present invention, the limitation must be taken into account. As shown above, the opposite is true in that the measurements mentioned above for the other references of record were for the intermediate product and not for the final product

IV. Claim 22

Not mentioned by the Examiner in the 102 or 103 rejections, claim 22 is not anticipated or obvious based on the references of record. For example, Busta fails to teach or suggest the buffer layer in a single body including a step as claimed as seen in the separate layers in figure 2B. Adachi also fails to teach or suggest such a structure. Furthermore, Yamazaki fails to teach or suggest such a structure as seen figure 6.

V. Allowable Subject Matter


The Examiner stated that Claims 2, 5, 6, and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The applicant appreciates the examiner's indication of allowability pertaining to claims 2, 5, 6, and 14. In accordance with 37 C.F.R. § 1.111(b), the applicant respectfully requests that the examiner temporarily hold objections and requirements as to form in abeyance until the remarks and amendments in this Amendment are considered by the examiner.

In view of the foregoing amendments and remarks, all claims are deemed to be allowable and this application is believed to be in condition to be passed to issue. If there are any questions, the examiner is asked to contact the applicant's attorney.

A fee of \$120 is incurred by filing a petition for a one (1) month extension of time. Applicant's check drawn to the order of the Commissioner accompanies this Amendment. Should there be a deficiency in payment, or should other fees be incurred, the Commissioner is authorized to charge Deposit Account No. 02-4943 of Applicant's undersigned attorney in the amount of such fees.

Respectfully submitted,


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